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Software Service Engineering

WS 2019/2020 – 9. Tutorial

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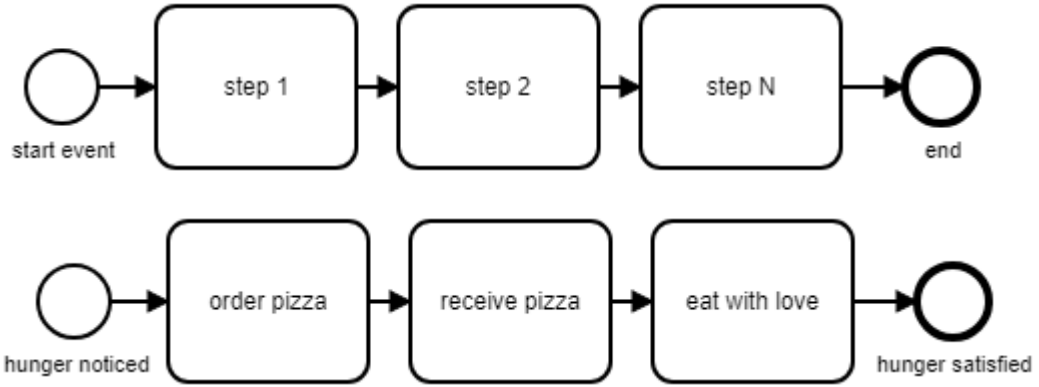
Agenda: Process Modeling

Process

- A **process** is a **series of steps and decisions** involved in the way some work is completed.
  - Preparing breakfast
  - Ordering a pizza
  - Applying for admission
  - Supplying product
  - Changing oil in a car
  - …



Business Process

- A **business process** or **business method** is a collection of related, structured activities or tasks by people or equipment which in a specific sequence produce a service or product for a particular customer or customers
  - On boarding new employees
  - Product Manufacturing
  - Supply Product
  - Customer service
  - …

Business **P**rocess **M**odeling (BPM)

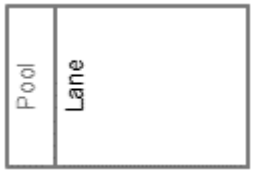
- The activity of **representing processes** of an enterprise
- Helps to analyse the current process in order to improve and automate
- Often realized through some diagrams
- Notations and Tools are involved

Business **P**rocess **M**odeling and **N**otation (BPMN)

- A Standard for Business Process Modeling (BPM)
- Maintained by the Object Management Group (OMG)
- Provides a graphical notation for specifying business processes in a Business Process Diagram (BPD)
  - Flowcharting technique
  - Very similar to activity diagrams from UML
- Also provides Business Process Execution Language (BPEL).
- We will be discussing about BPMN 2.0

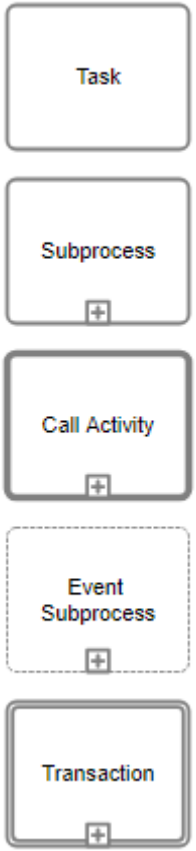
BPMN 2.0 Symbols

Participants

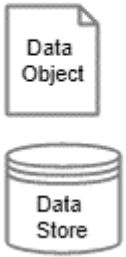


Gateways

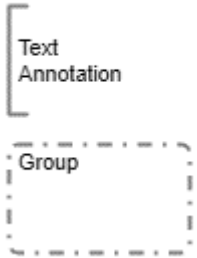
Activities



Data



Artifacts



Type	Start			Intermediate				End
	Normal	Event Subprocess	Event Subprocess non-interrupt	catch	boundary	boundary non-interrupt	throw	
None	○							
Message	✉	✉	✉	✉	✉	✉	✉	✉
Timer	🕒	🕒	🕒	🕒	🕒	🕒		
Conditional	≡	≡	≡	≡	≡	≡		
Link				⇨			⇨	
Signal	△	△	△	△	△	△	▲	▲
Error		⚡			⚡			⚡
Escalation		Ⓐ	Ⓐ		Ⓐ	Ⓐ	Ⓐ	Ⓐ
Termination								●
Compensation		⏪			⏪		⏪	⏪
Cancel					⊗			⊗
Multiple	⬠	⬠	⬠	⬠	⬠	⬠	⬟	⬟
Multiple Parallel	✚	✚	✚	✚	✚	✚		

Useful Tools

- Camunda Modeler (https://camunda.com/)
- Cawemo (https://cawemo.com/)
- BIMP (http://bimp.cs.ut.ee/)

- Useful links:
  - https://camunda.com/bpmn/reference/

1 Task 1

Prepare your working environment for this tutorial.

Install the **Camunda Modeler** in local machine

or,

Sign up for the online tool **Cawemo**

BPMN 2.0: Tasks

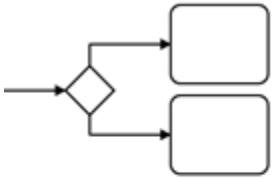
- BPMN Diagrams can be realized as a collection of sequence flows
- Task is a flow elements
- Defines **Things have to be done**

Task Types

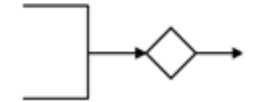
BPMN 2.0: Gateways

- Gateways are BPMN flow elements, which are used to control how sequence flows interact as they converge and diverge within a process.
- Gateways enable the implementation of branching, forking, merging, and joining of paths in a business process diagram.

- Some Gateways
  - Data-based Exclusive Gateway (XOR)
    - Ensures a single sequence flow to be passed for a token
  - Parallel Gateway (AND)
    - Facilitates forking & joining without condition
  - Inclusive Gateway (OR)
    - Facilitates forking & joining with condition
  - Event-based Gateway (XOR+Event)
    - Behaves just like an XOR Gateway in conjunction with events only



Process Flow Divergence



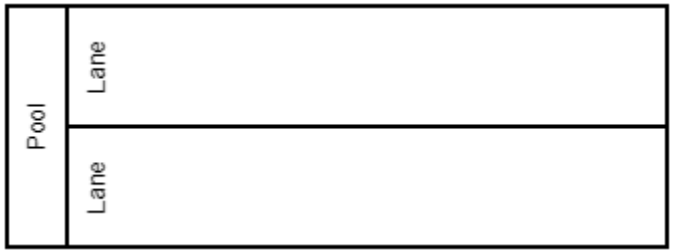
Process Flow Convergence

BPMN 2.0: Events

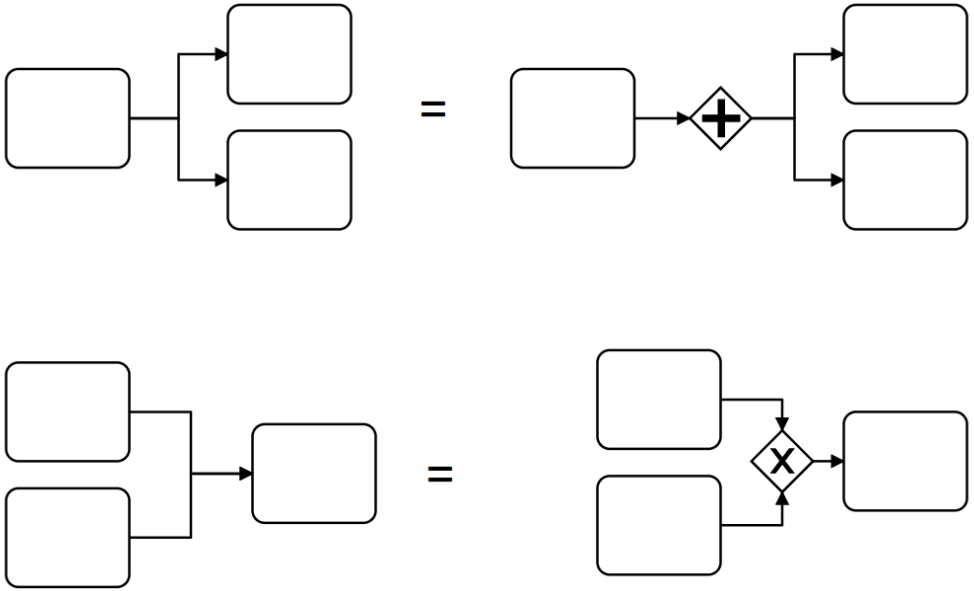
- Defined as the **things that are supposed to happen**
  - Start event
  - Intermediate event
  - End event
- All these events can be Catching events or Throwing events
- We will be learning by doing at this point

BPMN 2.0: Participants

- Pool
  - The conductor of an orchestra
  - Defines **what** to do in our processes
- Lane
  - Represents **who** is responsible for executing **which tasks**



BPMN 2.0: More on Gateways



Task 2

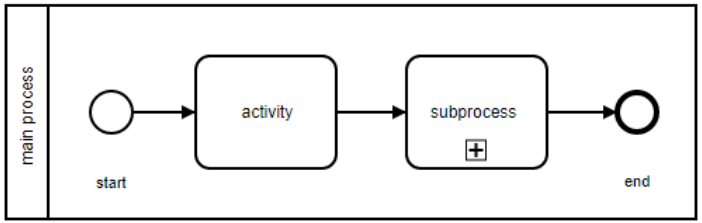
Model the following pizza order scenario as a collaboration diagram in BPMN 2.0. The participants are the Customer and the Pizza Vendor.

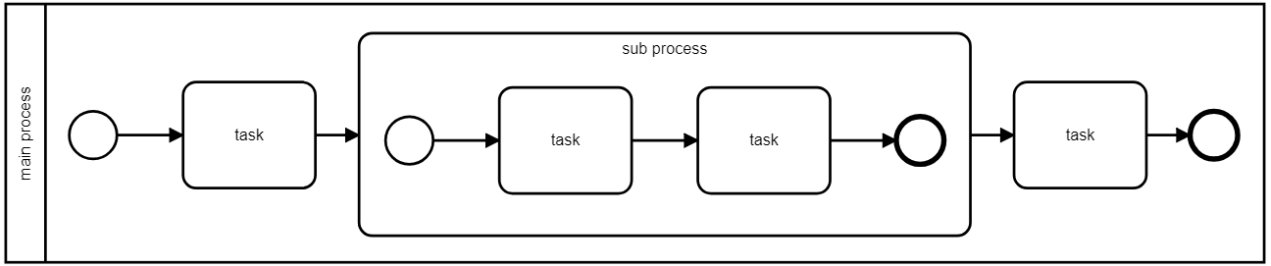
Consider that we have Customers who love Pizza. As soon as the hunger is noticed the Customer chooses the Pizza and order it via phone call. Such an order is received by the Clerk from the Pizza Vendor. She forwards the order to the Chef accordingly and the Chef bakes the Pizza. Once the Pizza is prepared, he handover it to the Delivery Boy for delivery. Upon the arrival of Pizza, the Customer clears the payment and gets a receipt in return. The only action left is to eat the pizza with love and thus hunger is satisfied.

During the process, after the order, if the Pizza does not arrive within 60 minutes the Customer might ask for the status, several times. Thus, the Clerk needs to calm down the Customer using his magical skills.

BPMN 2.0: Sub Process

- Encapsulates the complexity
- Enables Modularity
- Types
  - Collapsed Sub Process
  - Expanded Sub Process





Task 3

Consider the created pizza.bpmn from Task 2 and extend it towards the following descriptions:

1. Ordering the Pizza should not only be an abstract task but enhanced with more details. Thus, it should be possible to order not only via phone but also online via the webshop of the pizza vendor. In most cases the customers are calling the vendor and order via phone, to end up with the submission of the order. In the online version, they first have to open the website, fill the cart and add order details like their address and their name. Before submitting the order, the customer has to check the correctness.

2. The pizza vendor wants to add also the possibility of an online payment mechanism. Thus, the delivery boy will not have to receive the payment later. This online payment is only possible by ordering via the webshop and is signaled after the order check of the customer if chosen by the customer.

BPMN 2.0: More

- Complex Gateways
- Boundary Events

Homework

1. Model a collaboration diagram in BPMN 2.0 the given visa application scenario in **task sheet**. The participants are the visa applicant, the Visa Service Center (VSC) and the immigration office of the target country.

2. BIMP is a free and simple simulator for BPMN business processes to conduct multi-instance simulations. Develop for each of your drawn diagram two different scenarios, one simple case of running everything at least once and one more advanced stressing scenario. Simulate those scenarios with BIMP.

   What are your observations?

VSR

Your feedback on today's session:

mytuc.org/tgxs

Questions?

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